2008 Annual Survey of Government Employment Methodology

The U.S. Census Bureau sponsors and conducts this annual survey of state and local governments as authorized by Title 13, United States Code, Section 182.

The survey measures the number of federal, state, and local civilian government employees and their gross payrolls for the pay period including March 12, 2008.

Population of Interest

The population of interest for this survey includes the civilian employees of all the Federal Government agencies (except the Central Intelligence Agency, the National Security Agency, and the Defense Intelligence Agency), all agencies of the 50 state governments, and 89,476 local governments (i.e., counties, municipalities, townships, special districts, and school districts) including the District of Columbia.

Content of the Survey

The survey provides data on full-time and part-time employment, part-time hours worked, full-time equivalent employment, and payroll statistics by governmental function (i.e., elementary and secondary education, higher education, police protection, fire protection, financial administration, central staff services, judicial and legal, highways, public welfare, solid waste management, sewerage, parks and recreation, health, hospitals, water supply, electric power, gas supply, transit, natural resources, correction, libraries, air transportation, water transport and terminals, other education, state liquor stores, social insurance administration, and housing and community development).

The payroll data for the Federal Government are total monthly payroll only. There is no detail available for full-time or part-time employee payrolls. Three functions apply only to the Federal Government and have no counterpart at the state and local government levels: national defense and international relations, postal service, and space research and technology.

The questionnaires that were used to collect these data can be viewed at <GET FORMS> on the Government Employment and Payroll Website.

Critical definitions include the following:

Employment: Employment refers to all persons gainfully employed by and performing services for a government.

Employees: State and local government employees include all persons paid for personal services performed, including persons paid from federally funded programs, paid elected or appointed officials, persons in a paid leave status, and

persons paid on a per meeting, annual, semiannual, or quarterly basis. Unpaid officials, pensioners, persons whose work is performed on a fee basis, and contractors and their employees are excluded from the count of employees. For federal employees, employee counts are the on-board "head count" as of the end of the report period. The data collected for this survey include all federal civilian employees, including seasonal and intermittent employees, and employees on foreign assignments residing outside the 50 states and the District of Columbia. Employees of the Central Intelligence Agency, the National Security Agency, and the Defense Intelligence Agency are not included in any of the data presented by government function. federal judges, members of Congress and their staffs, employees of the Congressional Budget Office, and elected (with the exception of the President) and appointed officials of the Executive Branch are included. Employees of non-appropriated funds of defense activities are not classified as federal employees; therefore, they are excluded.

Full-time employees: Full-time employees are defined to include those persons whose hours of work represent full-time employment in their employing government.

Part-time employees: Part-time employees are those persons who work less than the standard number of hours for full-time work in their employing government.

Full-time equivalent: Full-time equivalent (FTE) is a computed statistic representing the number of full-time employees that could have been employed if the reported number of hours worked by part-time employees had been worked by full-time employees. This statistic is calculated separately for each function of a government by dividing the "part-time hours paid" by the standard number of hours for full-time employees in the particular government and then adding the resulting quotient to the number of full-time employees.

Payroll: Payroll amounts represent gross payrolls for the 1-month period of March (31 days). The gross payroll includes all salaries, wages, fees, commissions, bonuses, or awards paid to employees during the pay period that includes the date of March 12. Payroll amounts reported for a period other than 1-month are converted to represent an amount for the month of March. All payroll figures are represented in current whole dollars and have not been adjusted for inflation.

Conversion of a reported payroll to a payroll amount that would have been paid during a 31-day month is accomplished by multiplying the reported payroll by an appropriate factor. For example, a 2-week payroll is multiplied by 2.214, a 1-week payroll is multiplied by 4.429, and a twice-a-month payroll is multiplied by 2.000.

<u>Part-time hours</u>: These data represent the number of hours worked by part-time employees during the pay period. Note: These data are not collected for publication but rather are used to calculate full-time equivalent employment data.

Data Collection

The data that are collected in this survey are public record and are not confidential[1]. Data in these files are based on information obtained in the Annual Survey of Government Employment. Census Bureau staff compiled Federal Government data from records of the U.S. Office of Personnel Management. Thirty-nine of the state governments provided data from central payroll records for all or most of their agencies/institutions. Data for agencies and institutions for the remaining state governments were obtained by mail canvass questionnaires. Local governments were also canvassed using a mail questionnaire. However, elementary and secondary school system data in Florida, North Dakota, and Washington were supplied by special arrangements with the state education agency in each of these states. Additionally, in Delaware, the central collection respondent supplied data for the school districts. All respondents receiving the mail questionnaire had the option of responding electronically using the Employment Website developed for reporting the data. Of the respondents, 39.8 percent of local government respondents and 21.0 percent of state agency respondents chose to respond electronically.

The collection schedule follows:
03/2008	Initial mailout
04/2008	Reminder letter mailout
06/2008	Follow-up mailout

Sample Design

The 2008 Sample for the Annual Survey of Government Employment was developed in 2004 from the 2002 Census of Governments. It was designed to produce state-by-type of government estimates with a relative standard error of three percent or less on FTE employees and total payroll.

Units satisfying the following criteria were automatically included in the sample with a probability of 1.0000. These certainty units represent themselves only.

- All county governments with a 2002 population of 100,000 or more.
- All municipalities with a 2002 population of 75,000 or more.
- All townships with a 2002 population of 50,000 or more.
- All independent school districts with an enrollment of 10,000 or more.
- All school districts providing college level (postsecondary) education.
- All special districts that meet at least one of the following criteria:
    - FTE of 1,000 or more,

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[1] Title 13, United States Code, Section 9.

- All water utilities (function code 91) in the state of Connecticut,
- All electric utilities (function code 92) in the states of Maine, New Hampshire, Rhode Island, Utah, and Wisconsin,
- All gas utilities (function code 93).

All other units were given a chance of selection based on the FTE employment or total payroll of the unit. Prior to selecting the sample, the sampling frame was sorted by state; within state, by type of government (city, county, township, special district, school district); and within type of government by population for cities, counties, and townships and by enrollment for school districts. For special districts, the sampling frame was sorted by probability of selection within function code. (Note: See Chapter 12 of the <2006 Classification Manual> for the categories for classifying Employment data.)

Prior to mail-out, the sample universe file is updated with births (units that did not exist during prior years of the survey) that have come into existence since the prior year processing cycle. All city, county, township, and school district births are added to the sample with a probability of selection of 1.0000. Special district births are sampled at a rate of 1 in 25.

Weighting
The weight for each unit in the sample is the reciprocal of that unit's probability of being selected into the sample. For example, for units that were included in the sample with a probability of 0.0200, the weight is (1 / 0.0200) = 50. For units that were included in the sample with a probability of 1.0000, the weight is 1.0000.

Sample size
The sample size is approximately 11,405 units. Of the total number of governments in the sample, approximately 13.1 percent are counties, 23.1 percent are cities, 14.0 percent are townships, 30.7 percent are special districts, and 19.1 percent are school districts. All 50 state governments and the District of Columbia are certainty units with a weight of 1.0000.

Data Processing

Editing
Editing is a process that tries to ensure the accuracy, completeness, and consistency of survey data. Efforts are made at all phases of collection, processing, and tabulation to minimize reporting, keying, and processing errors.

Although some edits are built into the Internet data collection instrument and the data entry programs, the majority of the edits are performed post collection. Edits consist primarily of two types: (1) *consistency edit* and (2) an *historical ratio edit* of the current year's reported value to the prior year's value.

The *consistency edits* check the logical relationships of data items reported on the form. For example, if a value exists for employees for a function then a value

must exist for payroll also. If part-time employees and payroll are reported then part-time hours must be reported and vice versa.

For each function reported for the employees, the *historical ratio edits* compare data for the number of employees and the average salary between reporting years. If data fall outside of acceptable tolerance levels, the item is flagged for review. Additional checks are made comparing data from the Annual Finance Survey to data reported on the Census of Government Employment to verify that if employees are reported on the Census of Government Employment at a particular function the government also reported a corresponding expenditure on the Annual Finance Survey.

For *historical ratio edits* and *consistency edits*, the edit results are reviewed by analysts and adjusted as needed. When the analyst is unable to resolve or accept the edit failure, contact is made with the respondent to verify or correct the reported data.

Imputation
Not all respondents answer every item on the questionnaire. There are also questionnaires that are not returned despite efforts to gain a response. Imputation is the process of filling in missing or invalid data with reasonable values in order to have a complete data set for estimating state and national totals.

For general purpose governments and for dependent and independent school districts, the imputations were based on recent historical data from either a prior year annual survey or the 2007 Census of Government Employment, if available. These data were adjusted by a growth rate that was determined by the growth of units that were similar (in size, geography, and type of government) to the nonrespondent. If there was no recent historical data available, the imputations were based on the data from a randomly selected donor that was similar (based on the same criteria) to the nonrespondent. The selected donor's data was adjusted by dividing each data item by the population (or enrollment) of the donor and multiplying the result by the nonrespondent's population (or enrollment).

For special district governments, if prior year data are available, the data are brought forward with a national level growth rate applied. Otherwise, the data are imputed to be zero. In cases where equivalent-quality (as determined by research) secondary data sources exist, the data from those sources were used.

Estimation

Estimation is the process by which sample data are used to indicate the value of an unknown quantity in a population. In the publications for employment statistics, total full-time equivalent employment, total March payroll, and full-time equivalent per capita ratios are published. A simple unbiased estimate for each variable can be obtained from the data by multiplying the value of each variable

by its weight.

Generally, the value of each variable from the 2007 Census of Government Employment was used to adjust the current year sample estimate by a factor, which accounts for how much the sample under- or over-estimated the census total. This factor may reduce the variability of the estimate. However, there were some exceptions. The simple unbiased estimate was used for all of the variables in four small states (i.e., Delaware, Hawaii, Nevada, Rhode Island), Washington, D.C., and any cases where there were fewer than 20 units with a weight greater than 1.0000 contributing to the estimate.

Sampling Variability

The data that are provided come from a sample rather than a census of all possible units. The particular sample that was selected is one of a large number of possible samples of the same size and sample design that could have been selected. Each sample would have yielded different estimates. The estimated coefficients of variation, which are provided for each estimate, are an estimate of this sampling variability. In this tabulation the coefficients of variation are expressed as percentages. The coefficient of variation is the standard error as a proportion of the magnitude of the estimate. In the tables, the coefficient of variation expresses the standard error as a percentage of the quantity being estimated.

The sample estimates and coefficients of variation provided in the files can be used to construct interval estimates with a specified probability that the interval includes the average of the estimates of the parameter derived from all possible samples of the same size and design. For example, if all possible samples were surveyed under essentially the same conditions and estimates calculated from each sample, then:

1. Approximately 68 percent of the intervals from one standard error (the product of the coefficient of variation and the point estimate) below the estimate to one standard error above the estimate would include the average value of all possible samples.
2. Approximately 90 percent of the intervals from 1.65 standard errors below the estimate to 1.65 standard errors above the estimate would include the average value of all possible samples.

Thus, for a particular sample, one can say with specified confidence that the average of all possible samples is included in the constructed interval.

Example of a confidence interval. The estimate of total full-time equivalent state and local government employment for Alabama in 2008 is 288,820 and the estimated coefficient of variation is 0.63 percent. The standard error is then 0.63 percent of 288,820 or 1,820.

An approximate 90-percent confidence interval can be constructed by first multiplying the standard error by 1.65 and then adding and subtracting that result from the estimate to obtain the upper and lower bounds.

- ❑ Calculate the half-width of the confidence interval: 1.65 x 1,820 = 3,003.
- ❑ Construct the confidence interval by adding the estimated half-width to (288,820 + 3,003) and subtracting the same value (288,820 − 3,003) from the estimate of total to get the confidence interval which ranges from 291,823 to 285817.

State government employment and payroll data are not subject to sampling error. Consequently, state and local government aggregates for individual states are more reliable statistically than the local government only estimates.

Nonsampling Errors: Although every effort (as described in the Data Processing section) is made in all phases of collection, processing, and tabulation to minimize errors, the sample data are subject to nonsampling errors (such as, inability to obtain data for every variable from all units in the sample, inaccuracies in classification, response errors, misinterpretation of questions, mistakes in keying and coding, and coverage errors). These same errors may be evident in census collections and may affect the Census of Governments data used to adjust the sample during the estimation phase and used in the imputation process.

Modal Distribution: Each respondent that received a mail questionnaire had the option of returning the paper questionnaire, reporting data using a website developed for reporting data electronically, or working directly with staff members to report over the phone, fax or email. In addition, some governments have developed alternative reporting arrangements, known as central collection. The following table shows the response rate by mode for state and local governments that reported to the Census of Governments Survey of Government Employment and for the governments that reported to the Census of Governments Local Government Directory Survey (G-30).

	State Governments	Local Governments
Web	21.0%	39.8%
Paper	17.4%	39.9%
Central Collection	57.2%	0.9%
Other	4.4%	19.4%

Overall Unit Response Rate: The overall unit response rate to the 2008 Annual Survey of Government Employment was 91.0 percent. All of the 50 state governments responded to the survey. In determining the unit response rate, a

unit was determined to be a respondent if it provided information on all of the key variables for at least one function on the survey form. This unit response rate was calculated for each state as well as for the total U.S., and gives the percentage of the units in the eligible universe that actually responded to the survey.

$$\text{Overall Unit Response Rate} = \frac{\text{Number of units who reported all key variables for at least one function}}{\text{Number of units in the eligible universe}} \times 100$$

For 2008, weighted item response rates are published for each item. This rate is calculated by dividing the weighted value of the item as reported by respondents by the weighted value of the item reported for respondents and imputations for nonrespondents.

Total Quantity Response Rate: The Total Quantity Response Rate was also calculated for the key variables for each state. This response rate is computed separately for each key variable by summing the data provided by the respondents for the key variable and dividing this sum by the sum of the respondent data and the imputed data for the key variable. The result is multiplied by 100. Total Quantity Response Rates for full-time equivalent and total payroll for all function codes are available in the downloadable excel files.

$$\text{Total Quantity Response Rate for key variable} = \frac{\text{Sum of response data for key variable}}{\text{Sum of all data for key variable}} \times 100$$

Response Rate Tables

State & Local Response Rates [TXT, 5KB] – Unit and Total Quantity response rates by state for state and local governments combined

Local Response Rates [TXT, 5KB] – Unit and Total Quantity response rates by state for local governments

State & Local Excel Spreadsheets [EXCEL, 366KB] – Data and response rates by government function for each state for state and local governments combined

Local Excel Spreadsheets [EXCEL, 365KB] – Data and response rates by government function for each state for local governments